

RADON INFORMATION

City of Willmar Building Department

Residential Foundation Systems (Passive System)

1303.2400

PURPOSE AND SCOPE

Subpart 1. Applicability; residential structures. The purpose of parts 1303.2400 to 1303.2402 is to establish minimum requirements for passive radon control systems that apply to all new residential structures listed in items A to H:

- A. One-family dwellings
- B. Two-family dwellings
- C. Townhouses
- D. Apartment buildings
- E. Condominiums
- F. Multistory buildings that include any residential occupancy; and
- G. Mixed-occupancy buildings that include any residential occupancy; and
- H. Any addition to an existing dwelling that currently has a radon control system incorporated into the existing building.

If a fan is installed in a passive radon control system, this creates an active radon control system that must comply with the requirements of parts 1303.2400 to 1303.2403.

Subpart 2. Applicability; design features. The requirements in parts 1303.2400 to 1303.2402 shall apply to any structure identified in subpart 1, items A to H, if the structure is designed with any of the features identified in items A to F:

- A. A basement concrete slab in contact with the earth
- B. A crawl space within the building's conditioned space that has a concrete or earth floor
- C. A wood foundation floor constructed on or directly above the earth
- D. Slab on grade construction designs
- E. Attached or tuck-under garages, unless the floor, wall and ceiling assemblies separating the garage from the dwellings are sealed; and
- F. Any building configuration that allows radon gas to enter the residential dwelling.

Exceptions:

- 1. Crawl spaces outside the conditioned space of the residential dwelling, when the crawl space is ventilated directly to the outside atmosphere according to IRC Sections R408.1 and R408.2; IBC Sections 1203.3 and 1203.3.1; Code of Federal Regulations, Section 3285.505; and Minnesota Rules, Chapter 1350.
- 2. Hotels and motels
- 3. Additions to existing dwellings that do not currently have a radon control system incorporated into the existing dwelling.

Subpart 3. Mixed occupancy or multistory mixed occupancy buildings. When the nonresidential occupancy is in contact with the earth, all assemblies that separate the occupancies must be sealed to prevent the movement of air and airborne gases between the nonresidential and residential occupancies. When the residential occupancy is in contact with the earth and adjacent to a nonresidential occupancy, the residential occupancy shall incorporate a radon control system and all assemblies that separate the nonresidential and residential occupancy shall be sealed to prevent the movement of air or airborne gases.

1303.2402
REQUIREMENTS FOR PASSIVE
RADON CONTROL SYSTEMS

Subpart 1. Gas permeable material preparation. A gas-permeable material shall be placed on the prepared subgrade under all floor systems.

Subpart 2. Soil-gas membrane installation. A soil-gas membrane shall be placed on top of the gas-permeable material prior to placing a floor on top of or above the soil. The soil-gas membrane shall cover the entire floor area. Separate sections of membrane must be lapped at least 12 inches (305 mm). The membrane shall fit closely around any penetration of the membrane to reduce the leakage of soil gases. All punctures or tears in the soil-gas membrane shall be repaired by sealing and patching the soil-gas membrane with the same kind of material, maintaining a minimum 12-inch (305 mm) lap.

Subpart 3. "T" fitting. A "T" fitting shall be installed beneath the soil-gas membrane with a minimum of 10 feet of perforated pipe connected to any two openings of the "T" fitting, or by connecting the two openings to the interior drain tile system. The third opening of the "T" fitting shall be connected to the vent pipe. The perforated pipe or drain tile and the "T" fitting shall be the same size as the vent pipe. All connections to the "T" fitting shall be tight fitting.

Subpart 4. Potential entry routes. Potential entry routes for radon gas shall be sealed according to this subpart, as applicable.

- A. **Floor openings.** Floor openings around bathtubs, showers, water closets, pipes, wires, or other objects that penetrate the soil-gas membrane and the concrete slab or other floor systems, shall be sealed.
- B. **Concrete joints.** All control joints, isolation joints, construction joints, or other joints in the concrete slab, or the joint between the concrete slab and a foundation wall, shall be sealed. All gaps and joints shall be cleared of all loose material prior to sealing.
- C. **Foundation walls.** Penetrations of all foundation wall types shall be sealed. Joints, cracks, or other openings around all penetrations of both exterior and interior surfaces of foundation walls shall be sealed.
 - (1) Hollow block masonry foundation walls shall be constructed with either:
 - (a) continuous course of solid masonry at or above the exterior ground surface;
 - (b) one course of masonry grouted solid at or above the exterior ground surface; or
 - (c) a solid concrete beam at or above the finished exterior ground surface.
 - (2) When a brick veneer or other masonry ledge is installed, the masonry course immediately below the veneer or ledge shall be solid or filled.
- D. **Unconditioned crawl spaces.** All penetrations through floors or walls into unconditioned crawl spaces shall be sealed. Access doors into unconditioned crawl spaces shall be gasketed. Crawl space ventilation shall be provided according to part 1303.2400.
- E. **Sumps.** A sump connected to interior drain tile may serve as the termination point for the vent pipe, if the sump cover is sealed or gasketed and designed to accommodate the vent pipe. The sump pump water discharge pipe shall have a backflow preventer installed.

Subpart 5. Vent Pipes.

- A. **Single vent pipe.** The vent pipe shall be primed and glued at all fittings and shall extend up from the radon control system's collection point to a point terminating a minimum of 12 inches (305 mm) above the roof. The vent pipe shall be located at least 10 feet (2048 mm) away from any window or other opening into the conditioned spaces of the building. Vent pipes routed through unconditioned spaces shall be insulated with a minimum of R-4 insulation. Vent pipes within the conditioned envelope of the building shall not be insulated.
- B. **Multiple vent pipes.** In buildings where interior footings or other barriers separate the gas-permeable material into two or more areas, each area shall be fitted with an individual radon control system in accordance with item A, or connected to a single radon gas vent pipe terminating above the roof in accordance with item A.
- C. **Vent pipe drainage.** All components of the radon gas vent pipe system shall be installed to provide drainage to the ground beneath the soil-gas membrane.
- D. **Vent pipe accessibility.** Radon gas vent pipes shall be provided with space around the vent pipe for future installation of a fan. The space required for the future fan installation shall be a minimum of 24

inches (610 mm) in diameter, centered on the axis of the vent pipe, and shall extend a minimum distance of 3 vertical feet (914 mm).

Exception: Accessibility to the radon gas vent pipe is not required if the future fan installation is above the roof system and there is an approved rooftop electrical supply provided.

- E. Vent Pipe identification.** All radon gas vent pipes shall be identified with at least 1 label on each story and in attics and crawl spaces. The label shall read: "Radon Gas Vent System".
- F. Combination foundations.** Combination basement/crawl space or slab-on grade/crawl space foundations shall have separate radon gas vent pipes installed in each type of foundation area. Each radon gas vent pipe shall terminate above the roof or shall be connected to a single vent pipe that terminates above the roof.

Subpart 6. Power source. A power source consisting of an electrical circuit terminating in an approved electrical box shall be installed during construction in the anticipated location of the vent pipe fan to allow for the future installation of a fan into a passive radon control system to make the system an active radon control system. The power source shall not be installed in any conditioned space, basement, or crawl space.